AMENDMENTS TO THE DRAWINGS:

The attached sheets of drawings include changes to Figures 7 and 8. These sheets, replace the original sheets including Figures 7 and 8. In each of Figures 7 and 8, a legend "Prior Art" is appended.

REMARKS

The application has been amended and is believed to be in condition for allowance.

Claim Amendments/New Claims

Claim 1 has been amended to clarify the recitation of the field strength of the multiplication layer, finding support in the specification and the drawing figures (e.g., paragraph [0068]; Figures 2,5). Claims 1, 4-8, and 14-15 are also amended to address antecedent basis issues and in consideration of U.S. practice and preferences. The claim amendments do not introduce new matter.

New claims 16 and 17 depend from claim 1 and further distinguish the references cited by the Official Action. Claims 16 and 17 find support in the specification and the drawing figures (e.g., paragraphs [0017], [0030]-[0034], [0052], [0074]; Figures 1-2). No new matter is introduced by way of the new claims.

Drawing Figures

The Official Action objected to the Figures, stating that Figures 7 and 8 should be labeled with a legend such as "Prior Art".

In reply, both of Figures 7 and 8 have been amended to include a legend "Prior Art". Withdrawal of the objection is solicited.

Rejections Under 35 USC 102, 103

The Official Action rejected claims 1-2, 4-6, 8 and 14-15 under 35 USC 102(b) as being anticipated by Watanabe (US 5,552,629; "WATANABE").

The Official Action rejected claims 3, 7, and 9 under 35 USC 103(a) as being unpatentable over WATANABE in view of Funaba (US 5,281,844; "FUNABA").

The Official Action rejected claims 10-13 under 35 USC 103(a) as being unpatentable over WATANABE in view of Clark (US Pub. 2003/0226952; "CLARK").

The rejections are respectfully traversed for at least the reasons that follow.

It is firstly noted that claim 1 has been amended. It is respectfully submitted that WATANABE fails to teach a semiconductor photo-detecting element wherein a first field strength applied to an etching stopper layer, measured in a depth direction running through each of the layers of the photo-detecting element, is lower than a second field strength applied to a multiplication layer as measured in the depth direction.

On the contrary, WATANABE is silent regarding the difference of the electric field strengths in the depth direction. Hence, WATANABE does not teach or suggest the photo-detecting element recited in claim 1.

WATANABE is further distinguished from the present invention in that the reference expressly teaches that the

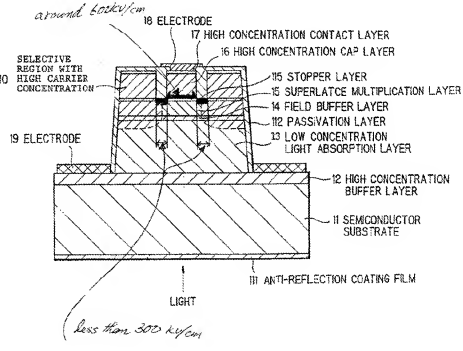
electric field intensity varies in the same etching or multiplication layer, at least along a lateral direction spanning the boundary between the layers.

WATANABE discloses that "only a region of the superlattice multiplication layer 15 just below the n^+ cap layer 16 has a high electric field of around 600 kV/cm so that the boundary surface with the passivation layer does not have a higher electric field," (column 7, lines 23-27). "Although a region being in contact with the passivation layer to which electric field is applied is the etching stopper layer 115 (or supperlattice multiplication layer) at a space between the cap layer 16 and the region 110, electric field intensity is less than 300 kV/cm," (column 7, lines 27-31; emphasis added).

In summarizing the disclosure, WATANABE teaches "A depletion layer extending from the p-n junction toward the superlattice multiplication layer extends to the boundary surface between the passivation layer and the n^+ cap layer (and etching stopper layer if it is used), however, electric field intensity in the lateral direction is less than 300 kV/cm," (column 2, lines 36-45; emphasis added). "According to the structure of the invention, electric field intensity on a region, to which the electric field is applied, exposed on the interface of the passivation layer is remarkably reduced," (column 2, lines 45-48; emphasis added).

Hence, WATANABE only discloses that the lateral electric field intensity of this region, to which an electric field is charged, is less than 300 kV/cm. Referencing Fig. 4 of WATANABE as a concrete example, the region, to which an electric field is charged, corresponds to the surface of the etching stopper layer 115 or the multiplication layer 15 contacted to the passivation layer 112 (see Fig. 4, below; annotations added).

FIG.4



Further, WATANABE discloses that the electric field intensity is around 600 kV/cm in this region to which an electric field is charged but which is not in contact with the passivation layer (i.e., the surface of the etching stopper layer 115 or the multiplication layer 15 covered by the high concentration cap layer 16; see Fig. 4, above, annotations added).

One skilled in the art would readily understand that in both of the etching stopper layer and the multiplication layer, the region in contact with the passivation layer has the lateral electric field intensity of less than 300 kV/cm, while the region in contact with the n^+ cap layer (i.e., does not contact the passivation layer) has the electric field intensity of around 600 kV/cm (see annotations to Figure 4, above).

In other words, the electric field intensity varies in the same etching or multiplication layer in WATANABE.

In contrast, claim 1 requires that a first field strength applied to the etching stopper layer be lower than a second field strength applied to the multiplication layer.

Claim 1, as amended, further requires that the difference in the first field strength applied to the etching stopper layer and the second field strength applied to the multiplication layer is measured in a depth direction, the depth direction being a direction running through each of the layers (e.g., a vertical direction through the horizontal layers 1-1 to 1-5 of Figure 1).

WATANABE neither teaches nor suggests these recitations of claim 1.

Accordingly, it is respectfully submitted that amended claim 1 is not anticipated by WATANABE, and therefore claim 1 is patentable.

It is further respectfully submitted that claims depending from claim 1 are patentable at least for depending from a patentable claim.

For example, it is respectfully submitted that claim 6 is patentable in its own right, in addition to being dependent from claim 1, at least for the following reasons.

The Official Action rejected claim 6 as anticipated by WATANABE stating that WATANABE discloses in Figure 6 the recited limitation, wherein a field buffer layer ("InAlAs") is between the multiplication layer ("InAlGaAs/InAlAs") 15 and the etching layer 115.

It is respectfully submitted that WATANABE does not teach a second field buffer layer of a second conductivity type, between the multiplication layer and the etching layer, configured to relax a field of the multiplication layer, as recited in amended claim 6.

On the contrary, WATANABE Figure 6 teaches a multiplication layer 15, on which there is an etching stopper layer 115 on a first side of the multiplication layer, and a p^+ type field buffer layer on the opposite second side multiplication layer.

WATANABE teaches "a p^+ type InP electric-field buffer layer 14 provided on the light absorption layer 13 and having a carrier concentration of 0.5 to 1 **x** 10^{18} cm^{-3} and a thickness of 0.1 to 0.05 μm (depending on the carrier concentration of the

field buffer layer 14), a non-doped i-type or n-type InAlGaAs/InAlAs superlattice multiplication layer 15 provided on the field buffer layer 14 having a carrier concentration of up to 2×10^{15} cm^{-3} and a thickness of 0.23 μm, [and] an InP etching stopper layer 115 provided on the superlattice multiplication layer 15 and having a thickness of 0.005 to 0.05 μm," column 6, lines 46-57.

WATANABE discloses an n^+ type InAlAs cap layer 16 on the etching stopper layer 115, but not between the etching stopper layer 115 and the multiplication layer 15, as required by claim 6. Hence, no disclosure in WATANABE, either in the specification or the drawing figures, teaches the second field buffer layer as recited.

Accordingly, claim 6 is patentable over WATANABE.

In addition, it is respectfully submitted that new dependent claims 16-17 are patentable in their own right, in addition to being dependent from a patentable claim, at least for the reasons set forth above.

Reconsideration and allowance of claims 1-17 are respectfully requested.

From the foregoing, it will be apparent that applicants have fully responded to the July 29, 2008 Official Action and that the claims as presented are patentable. In view of this, applicants respectfully request reconsideration of the claims, as presented, and their early passage to issue.

In order to expedite the prosecution of this case, it is requested that the Examiner telephone the attorney for applicants at the number set forth below if the Examiner is of the opinion that further discussion of this case would be helpful.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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JGM/lrs

APPENDIX:

The Appendix includes the following items:

- replacement drawing sheets for Figures 7 and 8